Light Transport Techniques for Tensor Field Visualization

Master's Thesis Presentation

Sebastian Bek

Heidelberg University
Visual Computing Group (VCG)
Supervisors: Prof. Filip Sadlo, Dr. Susanne Krömker

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Fundamentals - Finite-Time Lyapunov Exponents (FTLE)

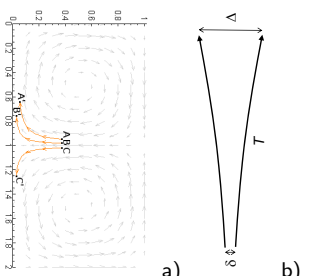
Definition

Local: $FTLE = \frac{1}{|T|} \ln \frac{\Delta}{\delta}$ (cf. Fig. b))

Global: $FTLE(\mathbf{x}) = \frac{1}{|T|} \ln \|\nabla \mathbf{u}(\mathbf{x})\|_2$

where $\|A\|_2 = \sqrt{\lambda_{\max}(A^T A)}$ is the spectral norm of matrix A

- measure for separation abilities of time-variant systems
- Lagrangian view in vector fields: placing particle, moving with flow



a) Vector field, b) Diverging pathlines

Source: b) Skript Prof. Sadlo, SciVis SS2017